

weight and a porosity ranging from 10 to 80%, and having a skin layer with no voids on its surface. The fibers present in the product having a weight-average fiber length ranging from 1 to 20 mm and the thermoplastic resin of the product is a polypropylene-based resin containing a polyolefin-based resin modified by the presence of an acid.

Another aspect of the invention is directed to an injection molded, light-weight, fiber-reinforced thermoplastic resin product having a relative bending strength of not less than 80 Mpa. The resin component of the product is selected from the group consisting of a polyolefin resin, a polystyrene resin, a polyvinylchloride resin, a polyamide resin, a polyester resin, a polyacetal resin, a polycarbonate resin, a polyaromatic ether, a polyaromatic thioether, a polyaromatic ester resin, a polysulfone resin and a polyacrylate resin. The resin product has a fiber content ranging from 5 to 80% by weight and a porosity ranging from 10 to 80%, and has a skin layer with no voids on its surface,. The fibers in the product have a weight average fiber length ranging from 1 to 20 mm.

Yet another aspect of the invention is directed to an injected molded, light-weight, fiber-reinforced thermoplastic resin product having a fiber content ranging from 5 to 80% by weight and a porosity ranging from 10 to 80%. The fibers in the thermoplastic resin have a weight-average length ranging from 1 to 20 mm. The product has a skin layer with no voids on its surface.

Another embodiment of the invention is directed to an injected molded, light-weight, fiber-reinforced thermoplastic resin product having a fiber content ranging from 5 to 80 % by weight and a porosity ranging from 10 to 80 %. The fibers in the product have a weight-average length ranging from 1 to 20 mm,. Further, the product has a skin layer with no voids on its surface, and is prepared by a process of melting and kneading a molding material

comprising fiber-containing thermoplastic resin pellets (A) having a fiber content ranging from 20 to 80 % by weight, the fibers being oriented parallel to each other and having a length ranging from 2 to 100 mm, or the molding material comprises a mixture of the fiber-containing thermoplastic resin pellets (A) and a thermoplastic resin except (A), the mixture having a fiber content ranging from 5 to 80 % by weight, injecting the molten resin into the cavity of a mold so closed that the volume of its cavity is smaller than the volume of the final molded product; and then, before or after the resin injection is completed, opening the mold until the volume of its cavity is equal to that of the final molded product.

Prior Art Rejection, 35 USC 102(b)

Claims 13-30 stand rejected based on 35 U.S.C. §102(b) as anticipated by Heetinga, U.S. Patent 6,129,870. This ground of rejection is respectfully traversed.

As is clear from a consideration of the Heetinga patent, the reference primarily is directed to an apparatus for the injection molding of a thermoplastic material under conditions which employ a blowing agent to prepare a foamed product. While the patent provides ample description of the molding apparatus employed to prepare a molded, foamed plastic article which is said to have an unfoamed outer skin, it provides very little description of the thermoplastic material(s) employed to prepare the molded product of the reference. A brief description of materials employed in the disclosed apparatus is found in column 5, lines 13-32. Preferred plastic injection materials include polypropylene containing azodicarbonamide blowing agent. Two other thermoplastics specifically mentioned are polyurethane and polystyrene.

From the above description of the disclosure of the Heetinga patent, it is clear that there is absolutely no teaching or suggestion in the patent of a light-weight, fiber-reinforced thermoplastic resin product having a fiber content of 5 to 80 % by weight and a porosity ranging from 10 to 80 %, wherein the fibers have a weight-average fiber length ranging from 1 to 20 mm. Moreover, there is absolutely no teaching or suggestion of a molded thermoplastic body prepared from a polypropylene-based resin containing a polyolefin-based resin modified by the addition of an acid thereto. Applicants therefore submit that the reference does not anticipate the molded product of present Claim 13, and withdrawal of the rejection of the claim is respectfully requested.

As to the embodiment of the injection molded product of Claim 16 which specifies twelve thermoplastic resins for the resin which is combined with from 5 to 80 % by wt of fibers having a weight average fiber length of 1 to 20 mm, to form a product having a porosity of 10 to 80 %, the Heetinga patent is silent as to disclosing any such molded material having the claimed features of Claim 16. Granted the molded product of patent has an unfoamed outer skin, nevertheless, there is no disclosure of a light-weight molded product which is fiber reinforced and which is limited to the specific identified thermoplastic resins of the present claims. Withdrawal of the anticipatory ground of rejection of Claim 16 is respectfully requested.

Given the comments above which demonstrate the distinction between the subject matter of present Claims 13 and 16 and the disclosure of Heetinga, it is evident that Heetinga does not teach the light-weight molded product of Claim 23 which specifies a molded product having a fiber content of 5 to 80 % by wt and a porosity of 10 to 80 %, wherein the fibers have a weight-average length of 1 to 20 mm. Accordingly, the patent does not anticipate the

invention aspect of Claim 23 and withdrawal of the rejection of the claim is respectfully requested.

Finally as to Claim 24, not only is the claim distinguished over Heetinga for the same reasons that Claims 13, 16 and 23 are distinguished over the patent, but also the patent does not disclose the processing steps of Claim 24, particularly the melting and kneading of molding material which comprises fiber filled thermoplastic resin wherein the fibers are, in fact, oriented parallel to each other. Clearly, Heetinga does not anticipate the injection molded product of Claim 24 and withdrawal of the rejection is respectfully requested.

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Frederick D. Vastine, Ph.D.
Registration No. 27,013



22850

(703) 413-3000
Fax #: (703)413-2220
FDV/kst

I:\atty\FDV\24210364-am.wpd